



ANDHRA KESARI UNIVERSITY :: ONGOLE

Programme: B. Voc., Medical Laboratory Technology MAJOR
(w.e.f. Academic Year 2025-26)

COURSESTRUCTURE

Year	Semester	Paper No.	Major	Hours	Credits		
I	I	1	Microbiology-1	3	3		
			Practical	1	1		
		2	Biochemistry-1	3	3		
			Practical	1	1		
	II	3	Microbiology-2	3	3		
			Practical	1	1		
		4	Pathology-1	3	3		
			Practical	1	1		
II	III	5	Biochemistry-2	3	3		
			Practical	1	1		
		6	Pathology-2	3	3		
			Practical	1	1		
		7	Human Anatomy-1	3	3		
			Practical	1	1		
		IV	8	Physiology-1	3	3	
				Practical	1	1	
	9		Classical Laboratory Practics-1	3	3		
			Practical	1	1		
	10		Human Anatomy-2	3	3		
			Practical	1	1		
	III	V	11	Physiology-2	3	3	
				Practical	1	1	
12 A			Clinical Laboratory Practices-2	3	3		
			Practical	1	1		
OR							
12 B			-----		3	3	
					1	1	
13 A			Routine Laboratory Techniques		3	3	
					1	1	
OR							
13 B			-----		3	3	

Not : In the III Year (during the V and VI Semesters), student are required to select a pair of electives form one of the **Two** specified domains. **For example : If set 'A' is chosen, course 12 to 15 to be chosen as 12A, 13A, 14A and 15A.** To ensure in-depth understanding and skill development in the chosen domain, students must continue with the same domain electives in both the V and VI Semesters.

AVRamesh 10/09/2025

SEMESTER -5
COURSE-11PHYSIOLOGY - 2
3Hrs / Week

TEACHING OBJECTIVES:

The teaching objectives of physiology aim to equip students with a comprehensive understanding of how the human body functions, encompassing normal physiological processes, the integration of organ systems, and the physiological basis of diseases, ultimately enabling them to apply this knowledge in clinical settings

LEARNING OUTCOMES:

Experimental Design and Analysis: Develop skills in designing experiments, collecting data, and interpreting physiological data.

Clinical Application: Apply physiological knowledge to understand and address clinical scenarios, including diagnosis and treatment.

Communication: Communicate physiological concepts effectively, both orally and in writing (e.g., journal-style reports).

Critical Thinking: Analyze physiological concepts critically, identify potential biases, and form well-supported conclusions.

Research Skills: Develop research skills, including literature review, data analysis, and interpretation of scientific findings.

Other Outcomes: Motivation for Lifelong Learning: Foster a sense of curiosity and motivation for continued learning and research in the field of physiology.

Teamwork and Collaboration: Develop skills in working collaboratively with others in scientific research and clinical settings.

Ethical Considerations: Understand the ethical implications of physiological research and practice.

SYLLABUS
PHYSIOLOGY - 2
UNIT I

NERVOUS SYSTEM (12hrs):

1. Functions of Nervous System in brief of all parts of CNS

2. EEG

3. CSF: formation, circulation, properties, composition and functions; lumbar puncture.

UNIT II

SPECIAL SENSES (6hrs):

1. **VISION:** functions of different parts of the eye. Refractive errors of eye and correction. Field of vision. Structure and functions of retina, Pupillary reflexes, color vision: color blindness, tests for color blindness.

2. **HEARING:** functions of outer, middle and inner ear, Deafness and Tests for deafness. Rinne's test. Weber's test.

UNIT III

Excretory System: Excretory Organs (10 hrs):

1. **KIDNEYS:** Functions of kidneys,

2. Functional unit nephron.

3. Mechanism of Urine Formation: GFR,

4. Selective Re absorption, substances reabsorbed, glucose, urea, amino acids, chlorides, H ions etc.
5. Properties and composition of normal urine, urine output. Names & Abnormal constituents in urine, Micturition, Cystourethrogram.
6. Diuretics, Renal Function Tests
7. Actions of ADH, aldosterone, PTH on kidneys.

UNIT IV

REPRODUCTIVE SYSTEM (6 hrs):

1. Functions of Reproductive system in male and female.
2. Semen secretion, composition, factors influencing, abnormalities, Oligozoospermia.
3. Ovulation, Menstrual cycle, Menstrual Fluid.
4. Pregnancy, Pregnancy tests.
5. Lactation factors affecting- composition of breast milk.

UNIT V

Muscle & Nerve Chapter - Included

PRACTICALS

Determination of packed cell volume
Calculation of Blood Indices
Fragility Test for R.B.C
Determination of Bleeding Time
Determination of Clotting Time
Blood Pressure Recording
Examination of arterial pulse included
Artificial Respiration
Determination of Vital Capacity

References:

1. Textbook of Physiology for BDS students by Dr. Jain
2. Textbook of Physiology for BDS students by Dr. Sambulingam

SEMESTER - 5
COURSE- ~~12A~~ CLINICAL LABORATORY PRACTICES – 2
3 Hrs / Week

TEACHING OBJECTIVES:

Communication and Interpersonal Skills: Effective communication with healthcare professionals, patients, and laboratory staff is essential.

Problem-Solving and Critical Thinking: Students should be able to apply critical thinking skills to analyze problems and find solutions.

Professionalism and Ethical Conduct: Adherence to professional standards, codes of ethics, and regulatory requirements is paramount.

Teamwork and Collaboration: Working effectively as part of a healthcare team is essential.

Lifelong Learning and Professional Development: Recognizing the need for continuous learning and professional development is important for staying current with advancements in the field.

Patient Safety: Prioritizing patient safety and adhering to safety protocols is a fundamental responsibility.

Confidentiality: Maintaining patient confidentiality is a critical ethical obligation.

LEARNING OUTCOMES:

Ethical and Professional Behavior:

They should demonstrate ethical and professional conduct in all aspects of their work, including patient interactions, communication with healthcare professionals, and adherence to laboratory regulations.

Confidentiality and Data Security:

Students should understand and uphold the principles of patient confidentiality and data security.

Communication Skills: They should be able to communicate effectively, both orally and in writing, with patients, healthcare professionals, and the public.

Teamwork and Collaboration: They should be able to work effectively as part of a healthcare team, collaborating with other professionals to provide optimal patient care.

Lifelong Learning: Students should demonstrate a commitment to lifelong learning and professional development, staying abreast of advancements in the field.

Safety and Compliance: They should understand and comply with all relevant laboratory safety regulations and standards.

SYLLABUS

CLINICAL LABORATORY PRACTICES – 2

UNIT I

Safety in Laboratories : General safety measures, biosafety precautions, levels of biosafety laboratories: BSL1, BSL2, BSL3, BSL4.

UNIT II

Ethical considerations : Non maleficence, beneficence, risk minimization, institutional arrangement, ethical review, transmission of ethical values, voluntariness, compliance.

UNIT III

Quality assurance: Internal and external quality assessment.

UNIT IV

Bio waste management.

UNIT V

Accidents and emergencies in the laboratory.

Practicals:-

1. Bio waste management
2. Bio safety

References: -

1. ICMR (2008) guidelines for good clinical laboratory practices.
2. Hospital waste Management : Chapter 13. Park's Text Book of Preventive and Social Medicine; 18th Ed.
3. NIH : DAIDS guidelines for Good Clinical Laboratory Practice Standards; 2011.
4. WHO :Good Clinical Laboratory Practice (GCLP), 2009.

130 SEMESTER - 5
COURSE ~~4~~ ROUTINE LABORATORY TECHNOLOGY
3 Hrs / Week

TEACHING OBJECTIVES:

Proficiency in Techniques: Students should gain proficiency in essential laboratory techniques, including sample collection, processing, and analysis.

Equipment Handling: Students should be able to confidently and accurately use laboratory equipment, including microscopes, pipettes, and other instruments.

Data Collection and Analysis: Students should learn to collect, record, and analyze data accurately and efficiently, using appropriate methods and tools.

LEARNING OUTCOMES:

Proficiency in Equipment Operation: Demonstrate competence in using and maintaining common laboratory equipment, including microscopes, centrifuges, spectrophotometers, and automated analyzers.

Sample Handling and Preparation: Accurately collect, prepare, and process samples for various laboratory tests, adhering to standard operating procedures (SOPs).

Quality Control: Understand and perform quality control procedures to ensure the accuracy and reliability of laboratory results.

Data Analysis and Interpretation: Accurately record and interpret laboratory data, identifying normal and abnormal findings, and relating them to relevant disease processes.

Troubleshooting: Identify and resolve common technical issues and equipment malfunctions, seeking appropriate assistance when necessary.

Understanding of Scientific Principles: Demonstrate a foundational understanding of the scientific principles underlying common laboratory techniques and procedures.

Safety and Ethical Conduct:

Laboratory Safety: Adhere to strict safety protocols and procedures, including the proper handling of chemicals, biological materials, and equipment.

Patient Confidentiality: Understand and maintain the confidentiality of patient information and laboratory results.

Ethical Conduct: Demonstrate ethical behavior and integrity in all aspects of laboratory work.

Professional Development:

Communication Skills: Effectively communicate laboratory results and findings to other healthcare professionals and patients.

Teamwork: Collaborate effectively with other laboratory personnel and healthcare professionals.

Continuous Learning: Demonstrate a commitment to ongoing professional development and staying current with advancements in laboratory technology and techniques.

Syllabus

Routine laboratory technology

UNIT -1

Routine Hematological Tests : Determination of hemoglobin concentration, determination of hematocrit, enumeration of formed elements, calculations of red blood cell indices MCV, MCH and MCHC, Automated systems in hematology, study of blood smear, reticulocyte count, erythrocyte sedimentation rate (ESR), eosinophil count, and platelet count.

UNIT II

Urine Examination: Urine analysis, routine examination of urine, rapid chemical tests of urine.

Clinical significance, specimen collection, laboratory investigations.

UNIT -III

Stool Examination: Gross examination, physical examination of stool, determination of pH, chemical examination of feces, microscopic examination of stool specimen.

Clinical significance, specimen collection, laboratory investigations.

UNIT-IV

Semen Examination

Semen analysis: Routine examination of semen, quantitative determination of semen fructose, interpretation of results, Sperm count, motility, viability, HOS test.

UNIT-V

Sputum Examination: Indication, collection, transport, preservation for different types of sputum analysis.

Physical, chemical and microscopic examination of sputum and its significance.

PRACTICALS:

- 1 To prepare of the 0.1N HCl.
- 2 To prepare the different concentration of solutions.
- 3 To prepare different bulbs required in the laboratory.
- 4 To determine the nature of the given solution.
- 5 To find out the normality of given solution.
- 6 Routine examination of urine physical examination of urine.
- 7 Determination of specific gravity of urine by urinometer and refracto meter.
- 8 Chemical examination of urine.
- 9 Microscopic examination of urine.
- 10 Physical and chemical examination of semen.
- 11 Microscopic examination of semen.
- 12 HOS test for sperm coiling
- 13 Physical examination of stool.
- 14 Chemical examination of stool.
- 15 Microscopic examination of stool.

Reference :

1. The Short Textbook of Medical Laboratory for Technicians - Satish Gupte (3rd Edition)
2. MCQ'S in Medical Laboratory Technology - Puneet Munjal & Samriti Sethi (Saurabh Publishers)
3. Textbook of Medical Laboratory Technology - Praful B. Godkar & Darshan P. Godkar (Standard Edition)

A. V. K. Anand
10/09/2020